

FESTIV POWER SYSTEM AND MARKET SIMULATION USER'S GROUP



PROJECT HIGHLIGHTS

- Train on EPRI codeveloped unique operations and market simulation software
- Learn how to test new solutions before implementation
- Understand how different strategies and market designs from diverse regions can impact outcomes
- Join members in learning/sharing modeling impacts
- Access EPRI modeling experts for support

Background, Objectives, and New Learnings

The electricity landscape is continuously evolving as emerging technologies are integrated into power systems and electricity markets. System operators must adapt to understand the impacts across multiple timescales and simultaneously understand economic efficiency, reliability, and, in market regions, market compatibility. However, it is not always practical for operators to test new operational or market products, constraints, formulations, and/or clearing algorithms in production software. There is also value in understanding the potential impacts on operations these decisions may have. Certain market and operational features are evolving significantly from year to year making it difficult for commercial software to keep up.

EPRI codeveloped the Flexible Energy Scheduling Tool for Integrating Variable generation (FESTIV) and continues to maintain the software for internal and industry use of the tool. FESTIV is an open-source steady-state power systems operation and market simulation tool that captures multiple scheduling horizons in power system operations including the following integrated modules:

- Day Ahead Security Constrained Unit Commitment (DASCUC)
- Real Time Security Constrained Unit Commitment (RTSCUC)
- Real Time Security Constrained Economic Dispatch (RTSCED)
- Automatic Generation Control (AGC)
- Frequency response and contingency dispatch

Each of these modules are integrated such that the outputs of one model serves as inputs to subsequent modules. FESTIV utilizes formulation and functional “mods” which allow users to alter the default formulation/behavior with minimal software development to expedite the design and analysis of new ideas.

The objective of the FESTIV User's Group is to support those interested in using FESTIV for their own studies and analyses in testing new ideas. The User's Group will introduce the mod features, their underlying formulations, and data needs necessary to run the tool. The User's Group will also serve as medium for learning the functionality of the tool, exploring potential use cases and problems that can be studied, and sharing lessons learned along the way.

Benefits

This project intends to equip system operators with the ability to perform offline analyses of new products, formulations, operating strategies, and other potential solutions to their specific challenges that are not possible with commercial software. The open-source tool bridges the seams of commercial production cost models and power flow/stability tools to evaluate economics and reliability simultaneously. Results from these analyses can be used to inform stakeholders, operators, and/or regulators of new potential ways to improve operations, system reliability, and economic efficiency that would ultimately benefit consumers. This can help facilitate the integration of emerging technologies into system operations, reliability under energy transformation, and market outcomes under different futures.

Project Approach and Summary

User Group interaction will be facilitated primarily through webcasts and training events. The following tasks will take place through the User's Group:

Task 1: User Development

- Conduct virtual training sessions with FESTIV to help onboard staff as users of the tool. Training includes detailed discussion of inputs/outputs of the model and simulation workflow.
- Provide access to EPRI modeling expertise via individual meetings to help advise on model development and FESTIV applications.
- Provide access to small mods that the EPRI team develops on prioritized areas.

Task 2: User Group Engagement

- Access to quarterly webinars with members of the FESTIV User's Group to share findings, best practices, and lessons learned.
- Collaborative guidance on new features to add to the tool that are beneficial for multiple users.

Deliverables

- Virtual training workshop for participant staff to facilitate tool understanding and application
- Sharing of published mods prioritized by the User's Group
- Quarterly collaborative webinars with the broader User's Group

Price of Project

The price to participate is \$25,000 per company.

This project qualifies for Self-Directed Funding (SDF).

Project Status and Schedule

This project is expected to start in Q2 of 2024 and run through December 2024. Training would happen within first quarter of company joining. Quarterly webinars and specific application training are scheduled throughout the year. These webinars will include user applications as well as EPRI-developed mods and how they can be used by users.

Who Should Join

ISOs, balancing area authorities, developers and other companies interested in performing their own analysis on new operational strategies or market designs without impacting production software.

Contact Information

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